

RCRA PERMIT
FOR THE
IDAHO NATIONAL LABORATORY

Volume 14
INTEC Liquid Waste Management System

Attachment 6, Sections F-3, F-4, and F-5
Procedures to Prevent Hazards

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CONTENTS

ACRONYMS	iii
F-3. Waiver or Documentation of Emergency Preparedness and Prevention Requirements	1
F-3a Equipment Requirements	1
F-3a(1) Internal Communications	1
F-3a(2) External Communications	1
F-3a(3) Emergency Equipment	1
F-3a(4) Water For Fire Control	4
F-3b Aisle Space Requirement	4
F-4. Preventive Procedures, Structures, and Equipment	5
F-4a. Unloading Operations	5
F-4b. Run-off	6
F-4c. Water Supplies	6
F-4d. Equipment and Power Failure	6
F-4e. Personnel Protection Equipment	8
F-4f. Releases to the Atmosphere	8
F-5. Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes	9

ACRONYMS

1	CFA	Central Facilities Area
2	CFR	Code of Federal Regulations
3	CPP	Chemical Processing Plant
4	DCS	Distributed Control System
5	DOE	Department of Energy
6	DOE-ID	Department of Energy, Idaho Operations Office
7	EP/RCRA CP	Emergency Plan/Resource Conservation and Recovery Act Contingency Plan
8	HEPA	high-efficiency particulate air
9	IDAPA	Idaho Administrative Procedures Act
10	INL	Idaho National Laboratory
11	INTEC	Idaho Nuclear Technology and Engineering Center
12	IWTU	Integrated Waste Treatment Unit
13	LET&D	Liquid Effluent Treatment and Disposal
14	PEWE	Process Equipment Waste Evaporator
15	RCRA	Resource Conservation and Recovery Act
16	TFT	Tank Farm Tank
17	TSDF	treatment, storage, or disposal facility
18	WAC	waste acceptance criteria

F-3 WAIVER OR DOCUMENTATION OF EMERGENCY PREPAREDNESS AND PREVENTION REQUIREMENTS

F-3a Equipment Requirements [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR §§ 270.14(b) and 264.32]

F-3a(1) Internal Communications [IDAPA 58.01.05.008; 40 CFR § 264.32(a)]

1 The ILWMS buildings are equipped with communication devices (e.g., two way radios, alarm
2 systems, etc.) capable of summoning emergency assistance. The personnel involved in the operation have
3 immediate access to emergency communication devices.

F-3a(2) External Communications [IDAPA 58.01.05.008; 40 CFR § 264.32(b)]

4 The INTEC communication devices provide access to external emergency response agencies.

F-3a(3) Emergency Equipment [IDAPA 58.01.05.008; 40 CFR § 264.32(c)]

5 The contingency plan, located in Section G of this permit, identifies evacuation routes and
6 locations of RCRA emergency equipment for the PEWE system, the LET&D facility, CPP-659, and the
7 IWTU.

CPP-604 PEWE System and TFT

9 Safety and emergency equipment located at CPP-604 is listed below:

- 10 • Fire sprinkler system
- 11 • Portable fire extinguishers
- 12 • Safety showers and eyewashes
- 13 • Spill control cabinet
- 14 • Plant voice paging and evacuation alarm system
- 15 • Communication devices.

16 For building fire protection, CPP-604 has a fire sprinkler system, which is a heat-activated
17 detection system. This system is connected to alarms at the INL Fire Department located at the Central
18 Facilities Area (CFA). Portable fire extinguishers located throughout the building are inspected monthly.

1 A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal
2 has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been
3 altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced
4 immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are
5 opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

6 **CPP-1618**

7 Safety and emergency equipment located at CPP-1618 is listed below:

- 8 • Fire sprinkler system
- 9 • Portable fire extinguishers
- 10 • Safety showers and eyewashes
- 11 • Spill control cabinets
- 12 • Plant voice paging and evacuation alarm system
- 13 • Communication devices.

14 For building fire protection, CPP-1618 has a fire sprinkler system, which is a heat-activated
15 detection system. This system is connected to alarms at the INL Fire Department located at the CFA.
16 Portable fire extinguishers located throughout the building are inspected monthly.

17 A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal
18 has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been
19 altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced
20 immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are
21 opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

22 **CPP-659**

23 Safety and emergency equipment located at CPP-659 are listed below:

- 24 • Fire sprinkler system
- 25 • Portable fire extinguishers
- 26 • Safety showers and eyewashes
- 27 • Spill control cabinets

- Plant voice paging and evacuation alarm system
- Communication devices.

CPP-659 has a fire sprinkler system, which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the CFA. Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

CPP-1696

Safety and emergency equipment located at CPP-1696 are listed below:

- Fire sprinkler system, except the shielded process cells
- Portable fire extinguishers
- Safety showers and eyewashes
- Spill control cabinet
- Plant voice paging and evacuation alarm system
- Communication devices.

For building fire protection, CPP-1696 has a fire sprinkler system (except in the shielded process cells), which is a heat-activated detection system. This system is connected to alarms at the INL Fire Department located at the CFA. Portable fire extinguishers located throughout the building are inspected monthly.

A seal is placed on the door of the spill cabinet. Monthly inspections check the seal. If the seal has not been altered, it is noted on the checklist and no inventory is performed. If the seal has been altered, an inventory of the cabinet is performed. If equipment is missing or out of date it is replaced immediately. Inspections are recorded on appropriate forms. At least annually the spill cabinets are opened, inventoried, and restocked, as necessary, to ensure shelf life of contents.

F-3a(4) Water For Fire Control [IDAPA 58.01.05.008; 40 CFR § 264.32(d)]

Two insulated fire water supply tanks with maximum capacities of 800,000 gal each supply the INTEC fire water system. These tanks are maintained between 400,000 and 600,000 gallons of water for fire suppression. Diesel powered pumps move water from wells to maintain these levels. Electric jockey pumps are located on the outlet lines that keep the fire water lines pressurized. Electric pumps are located on the outlets of these tanks to supply water for hose streams and automatic sprinklers at adequate volume and pressure.

F-3b Aisle Space Requirement [IDAPA 58.01.05.008; 40 CFR § 264.35]

Due to the hazardous characteristics and radioactive nature of the waste processed by the IWTU, techniques such as the use of cameras for inspections and the ability to perform remote maintenance have been engineered into the process. In those instances where hazards are reduced and controlled personnel movements are permitted, adequate aisle space will be maintained to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment.

In IWTU container storage areas, the Vault Loading Area and the Vault Storage Area, personnel movement will be administratively controlled to specified locations to prevent personnel from entering areas where emergency response capabilities may be limited. For instance, in the Vault Loading Area, inspections will be conducted from the cell entrance. Inspections from this area will be adequate to view three sides of the vault; however, there will not be sufficient room for personnel to circumnavigate the vault during an inspection. This would pose unacceptable risks to personnel due to the limited space around the vault and the potential for exposure to highly radioactive fields. The only waste stored in this area will be dry treatment product. In the event of a spill of the treatment product from a canister, any waste would be contained within the vault. Due to the dry nature of the waste, no runoff of waste is possible.

The vaults in the Vault Storage Area are configured so as to maintain a minimum 3-ft aisle space in the east/west direction. However, since two aisles are partially obstructed by 18-in. support beams, personnel will be restricted from accessing these aiseways and will only use the aisles that align with the access doors on the west side of the Vault Storage Area for inspection. Within each aisle the vaults will be stored in close proximity to one another. The overhang of the vault lids will generate a space that is approximately 6 inches between consecutive vault walls. This will allow inspection between vaults in the north/south direction; however, these aiseways will not be used for personnel movement. Like the Vault Loading Area, the only waste stored in the Vault Storage Area will be dry treatment product. In the event

1 of a spill of the treatment product from a canister, any waste would be contained within the vault. Due to
2 the dry nature of the waste, no runoff of waste is possible. Spill clean-up and decontamination would take
3 place by relocating vaults, as necessary, to access the leaking container and removing any spilled material
4 within the vault.

5 Due to the lack of combustibles and the non-ignitable and non-reactive nature of the treatment
6 product, there is no foreseeable emergency situation that would require vaults to be moved to resolve the
7 emergency.

F-4. PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

F-4a. Unloading Operations [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(i)]

8 Transfers of hazardous waste to and from ILWMS are conducted through piping systems. Wastes
9 generated at other INL Site facilities may be introduced to the ILWMS. Unloading operations are
10 controlled by standard operating procedures. During unloading operations, appropriate actions are taken
11 to contain particulate and radioactive emissions (e.g., use of a portable HEPA air mover). A stainless-
12 steel drip pan is used to collect possible leaks during unloading. Personnel will inspect for evidence of
13 improper connections before beginning the transfer or acceptance of waste. Waste staging areas will be
14 inspected for leaks or spills when waste is being received.

15 Containers are moved at CPP-1696 using equipment such as cranes, forklifts, and/or air jacks.
16 One canister per shipment will be loaded into an RH-72B transportation cask on a flatbed semi-trailer for
17 shipment to the ultimate disposal facility. These shipments must comply with applicable U.S.
18 Department of Energy, Department of Transportation, U.S. Environmental Protection Agency, U.S.
19 Nuclear Regulatory Commission, and disposal facility requirements.

20 Hazards in unloading and staging operations will be minimized through the following:

21 Waste handling areas are controlled to provide adequate space to allow unobstructed movement
22 of waste transfer equipment and personnel.

23 Operations personnel will be present at all times during unloading or staging operations;
24 therefore, any spilled or leaked material will be immediately detected and contained. Spill response will
25 be in accordance with the INL Emergency Plan Resource Conservation and Recovery Act Contingency
26 Plan (EP/RCRA CP), except for incidental spills, which would be immediately cleaned up.

Personnel will be trained as noted in Section H of this permit.

F-4b. Run-off [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(ii)]

Buildings CPP-604, CPP-649, CPP-659, CPP-1618, and CPP-1696 are fully enclosed buildings that prevent run-off from hazardous waste handling areas to other areas or the environment. Building CPP-1618 is inside the 100-year flood plain boundary and CPP-604, CPP-649, CPP-659, and CPP-1696 are outside of the 100-year flood plain boundary as postulated in the Big Lost River Flood Hazard Study, November 2005 (see Volume 3 of the INL permit application). The INL emergency plan provides for establishing plans for the protection of buildings and equipment as necessary during flooding conditions. This could include sand bagging or building berms, dikes, or trenches.

Appendices VI, VII, and VIII contain Engineering Design Files EDF-1747, EDF-2613, and EDF-2470. These EDFs discuss the effects of hydrostatic and hydrodynamic forces as a result of hypothetical flooding on the ILWMS. These studies demonstrate that the facilities would withstand the floodwaters.

F-4c. Water Supplies [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(iii)]

Contamination of water supplies by spills of mixed waste is prevented by building features such as high-density concrete base, stainless-steel lining, epoxy-coated walls, sloped floors, trenches, drains, double-encased piping, and liquid collection tanks, as well as various means of leak detection. See Section B, Facility Description, for typical building construction details.

F-4d. Equipment and Power Failure [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(iv)]

Some components of the ILWMS are supplied with redundant equipment. If equipment should fail on these systems, it would have minimal effect on the operating unit, since the redundant equipment would be started and the operation stabilized. The failed equipment would then be investigated to determine the cause of the failure, and repairs would be initiated. If a system that did not have redundant equipment were to fail, the operating unit would be secured.

Upon total loss of electrical power, ILWMS equipment that manages hazardous and mixed wastes is designed to shut down in a manner that protects employees, equipment, human health, and the environment.

1 Cranes and hoists are considered non-critical equipment and are not supplied with emergency
2 standby power. This type of equipment is designed to fail in place. Movement will be suspended until
3 power is restored.

4 The DCS is designed with battery backup to maintain operability and to ensure safe shutdown.

5 **CPP-604 PEWE System and TFT**

6 The Evaporator Feed Collection Tank (VES-WL-133), the Process Condensate Surge Tank
7 (VES-WL-131) and the Process Condensate Collection Tanks (VES-WL-106, VES-WL-107, and VES-
8 WL-163) are all equipped with two redundant transfer pumps.

9 The PEW evaporators (EVAP-WL-129 and EVAP-WL-161) and associated heat exchangers are
10 identical and may be operated independently or in parallel.

11 PEW evaporator bottoms can be stored/treated in either VES-WL-101 or VES-WL-111.

12 **CPP-1618 LET&D Facility**

13 The LET&D fractionators (FRAC-WLL-170 and FRAC-WLK-171) and associated heat
14 exchangers are identical.

15 The Acid Fractionator Bottoms Tank (VES-WLL-195) is equipped with two redundant transfer
16 pumps.

17 **CPP-659 ETS**

18 There are no redundant systems on the ETS. Upon loss of electrical power the operator would
19 initiate the Rapid Shutdown System (RSS). The RSS would secure the ETS in a configuration that is
20 protective of human health, the environment, and equipment.

21 **CPP-1696 IWTU**

22 The IWTU has a Rapid Shutdown System (RSS) which would secure the IWTU in a
23 configuration that is protective of human health, the environment, and equipment. The IWTU has
24 redundant equipment to allow safe operation of the steam reformers. In the event of a power failure, these
25 redundant systems enable the IWTU processes to be maintained in a stable configuration that is protective
26 of human health, the environment, and equipment until power is restored.

Both the Denitration and Mineralization Reformer and the Carbon Reduction Reformer are equipped with multiple redundant thermocouples in the fluidized bed region.

There is a redundant hydrogen monitor on the process gas outlet of the Denitration and Mineralization Reformer.

There is a redundant oxygen monitor on the offgas outlet of the Carbon Reduction Reformer.

There is a redundant offgas blower for the IWTU.

There is a redundant process exhaust blower for the IWTU.

There is a redundant building ventilation exhaust blower for the IWTU.

F-4e. Personnel Protection Equipment [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(v)]

Operations are conducted according to written procedures. Eyewash stations, safety showers, respirators and protective clothing are available as necessary to mitigate personnel exposure to hazardous waste.

F-4f. Releases to the Atmosphere [IDAPA 58.01.05.012; 40 CFR § 270.14(b)(8)(vi)]

CPP-604 PEWE System and TFT

In the event of a release to the vault from VES-WM-100, -101, or -102, the offgas would be contained in the vault until the hatch covers located in the sample corridor in CPP-604 were removed. Any release would then be removed by the offgas system that maintains a slight vacuum on the sample corridor to a high-efficiency particulate air (HEPA) filter system before being released to the atmosphere through the INTEC Main Stack.

In the event of a release to the rest of the vaults and cells associated with the PEWE system, the offgas would be removed by the offgas system that maintains a slight vacuum on the vaults and cells. The offgas would then be routed to a HEPA filter system before being released to the atmosphere through the INTEC Main Stack.

CPP-1618

In the event a release to the cells associated with the LET&D, the offgas would be removed by the building ventilation system that maintains a slight vacuum on the cells. The building ventilation is then routed to the ventilation APS HEPA filter system before being released to the atmosphere.

CPP-659

In the event of a release to the cells associated with the ETS, the air would be removed by the cell ventilation system that maintains a slight vacuum on the cells. The air would then be routed to a HEPA filter system before being released to the atmosphere through the CPP-659 stack.

CPP-1696

In the event of a release to the cells associated with the IWTU, the air would be removed by the cell ventilation system that maintains a slight vacuum on the cells. The air would then be routed to a HEPA filter system before being released to the atmosphere through the CPP-1696 stack.

F-5. PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES [IDAPA 58.01.05.008 AND 58.01.05.012; 40 CFR §§ 264.17(a) AND 270.14(b)(9)]

Waste acceptance criteria (WAC) have been established for wastes that are to be transferred to the ILWMS to prevent reaction of potentially incompatible wastes, see Section C-2f of this permit.

Waste must be characterized per procedure, to ensure waste compatibility before it can be transferred to CPP-604 TFT system.